



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,761	11/23/2001	Matti Kullervo Savelainen	PII 3340	3963

7590 10/07/2003
Thomas M. Lundin
PHILIPS MEDICAL SYSTEMS (CLEVELAND), INC.
595 Miner Road
Highland Heights, OH 44143

EXAMINER

SHRIVASTAV, BRIJ B

ART UNIT	PAPER NUMBER
----------	--------------

2859

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/991,761

Applicant(s)

SAVELAINEN, MATTI KULLERVO

Examiner

Brij B Shrivastav

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 and 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Oppelt et al (US 5,153,517).

As regards to claim 10, Oppelt et al teach a method of magnetic resonance imaging (figure 1, column 1, lines 6-26) comprising generating a main magnetic field and magnetic field gradients in the examination region (figure 1, numeral 8; column 1, lines 35-39), a transmitter polarizing dipoles to transmit circularly polarized radio frequency signals, and a receiver assembly having quadrature coils and each coil receiving said circularly polarized radio frequency signals (columns 1 and 2, lines 50-68, and 1-35, see abstract, figures 2-4, columns 2, 3 lines 56-68, 1-25, and column 3 and 4, lines 56-68 and 16-58).

As regards to claims 11-13, Oppelt et al teach at least two takeoff points for two signals and combining the phase shifted signals in quadrature, generating vertical magnetic field in an open magnet, and two dimensional coil disposed perpendicular to the main direction (figures 1 and 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oppelt et al (US 5,153,517) and further in view of Mehdizdeb et al (4,918,388).

As regards to claim 14, Oppelt et al do not teach a substrate having each of the two loops on each of the two sides of the substrate to reduce mutual inductance between the two quadrature coils. Mehdizdeb et al teach a substrate having each of the two loops on each of the two sides of the substrate to reduce mutual inductance between the two quadrature coils (figure 3). It would have been obvious to one ordinary skill in the art to adapt Mehdizdeb et al's coils on a substrate with the magnetic resonance imaging apparatus of Oppelt to improve sensitivity of the coils, and to increase comfort to the patient during imaging.

3. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Molyneaux et al (US 5,578,925) in view of Opplt (US 5,128,615), and further in view of Mehdizadeh et al (US 4,918,388).

As regards to claim 1, Molyneaux et al teach a magnetic resonance imaging apparatus having a main magnet assembly for generating a main magnetic field in an examination region (figure 1), a gradient coil assembly (figure 1, numerals 20, 22), a

Art Unit: 2859

radio frequency transmit coil assembly (figure 1, numeral 34), a radio frequency receiver coil assembly disposed perpendicularly in the examination region (figure 1, numerals 10, 30, 32, 50), and a reconstruction processor (figure 1, numeral 56). Molyneaux et al do not teach, a) a transmitter polarizing dipoles producing circularly polarized resonance signals and a radio frequency receiver coil assembly for receiving circularly polarized resonance signals, and b) a planar substrate and an array of quadrature coils disposed on the substrate, so that each coil having first loop on the first surface and the second loop on the second surface of said substrate, respectively. Oppelt et al teach, a) a transmitter polarizing dipoles producing circularly polarized resonance signals and a radio frequency receiver coil assembly for receiving circularly polarized resonance signals (figures 2, 3, see abstract, and b) Mehdizadeh et al teach a planar substrate and an array of quadrature coils disposed on the substrate, so that each coil having first loop on the first surface and the second loop on the second surface of said substrate, respectively (figure 1, numeral 14, and figure 3, see abstract).

It would have been obvious to one of ordinary skill in the art to adapt transmitter and receiver coil(s) of Oppelt and planar substrate having coils of Mehdixadeh et al with the magnetic resonance imaging apparatus of Molyneaux et al to increase sensitivity of the coil system and to increase patient comfort during imaging.

As regards to claim 2-9, Molyneaux et al further teach a vertical magnet (figure 1) having a surface coil assembly with second loop portion comprising an offset from the first loop portion and each quadrature coil comprises at least two takeoff points and the adjacent coil do not overlap (figures 3-7, 12-14)

Art Unit: 2859

4. Claims 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oppelt et al (US 5,153,517) and further in view of Mehdizdeb et al (4,918,388).

As regards to claim 15, Oppelt et al teach an array of quadrature coils comprising a first loop portion and a second loop portion and to be used to receive circularly polarized resonance signals in a magnetic resonance imaging system (figures 1-4). Oppelt et al do not teach a planar substrate having each of the two coils of the said array on each of the two faces of the substrate. Mehdizdeb et al teach a planar substrate having each of the two coils of the said array on each of the two faces of the substrate (figure 3).

It would have been obvious to one of ordinary skill in the art to adapt Mehdizdeb et al's coils on a substrate with the magnetic resonance imaging apparatus of Oppelt to improve sensitivity of the coil, and to increase comfort to the patient during imaging.

As regards to claims 16-20, Oppelt et al teach a quadrature radio frequency surface coils which are not overlapped and disposed relative to each other or having two-dimensional array or used as a transmit coil (figures 2-4, 7-8 and 11).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brij B Shrivastav whose telephone number is 703-305-0649. The examiner can normally be reached on 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached on 703-308-3875. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

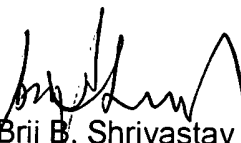
Application/Control Number: 09/991,761

Page 6

Art Unit: 2859

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0956.

Bbs



Brij B. Shrivastav
Patent Examiner